

REMARKS

Claims 1-15 are all the claims pending in the application.

Claim Rejections - 35 U.S.C. §§ 102/103

(A) On page 2 of the office Action, Claims 1-3, 5-13 and 15 are rejected under 35 U.S.C. § 102(b) as allegedly anticipated by or, in the alternatively, under 35 U.S.C. § 103(a) as allegedly obvious over Kasuga "Formation of titanium oxide nanotube," American Chemical Society (1998) (hereinafter "Kasuga I"). Applicants traverse the rejection for the following reasons.

The Present Invention

Applicants initially submit that the present invention as recited in Claim 1 provides a titania nanotube having a length of 10 μm or more. The titania nanotube is produced by, for example, a method comprising the step of dispersing a titania powder in a sodium hydroxide aqueous solution at a temperature of 60°C or more. *See*, Claim 5. In this method, dispersing is advantageously conducted by stirring or irradiation with an ultrasonics. Specifically, dispersion is advantageously conducted by a method in which a titania powder and a sodium hydroxide aqueous solution are placed in a vessel with a stirrer, and the mixture in the vessel is stirred, or by a method in which a titania powder and a sodium hydroxide aqueous solution are mixed and the mixture is irradiated with an ultrasonics, or by a method combining them. *See*, page 6, lines 13 to 21 of the specification. In other words, dispersing is not conducted in a static state.

Disclosure of the Reference and Comparison of Claims 1 and 4 with the Reference

Kasuga I relates to formation of titanium oxide nanotube.

In Office Action, it is argued that "Kasuga teaches a method of producing titania nanotube by dispersing nanometer size titanium dioxide in sodium hydroxide at temperature of

60 degrees C (Page 3161 Column 2). The resulting nanotubes have a diameter of 0.05 - 0.15 microns and an aspect ratio between 40 and 100 (Page 3160 Column 1).”

However, Applicants submit that Kasuga I does not disclose that a titania powder is dispersed in a sodium hydroxide aqueous solution at a temperature of 60° C or more, but instead, disclose that “[f]ive milligrams of the powders was put into a Teflon vessel with 20 mL of NaOH aqueous solution with the concentration 2.5, 5, 10, or 20 M. The vessel was then placed in a stainless steel vessel, which was closed tightly, and held for 20 h at 20, 60, or 110° C.” *See*, page 3161, column 2.

Furthermore, Kasuga I state that “it was confirmed... that the TiO₂ nanotubes (anatase phase) with the diameter \approx 8 nm and the length \approx 100 nm are formed steadily by treatment with 10 M NaOH aqueous solution for 20 h at 110° C.” *See* page 3163 lines 4-8. Applicants submit that the mark of \approx means “not more than.”

Further still, Kasuga I have not confirmed the TiO₂ nanotubes with a length of 100 nm or more were obtained. Applicants submit that the method disclosed in Kasuga I, which does not disclose the dispersing step, does not result in TiO₂ nanotubes with a length of 100 nm or more, as required by the claims.

Accordingly, Kasuga I as a whole does not teach or suggest a titania nanotube having a length of 10 μ m or more. Applicants respectfully submit that Claim 1 is patentable over Kasuga I, and that Claims 2-3, 5-13 and 15 are also patentable by virtue of their dependency from Claim 1.

Withdrawal of the rejection is respectfully requested.

(B) On page 3 of the Office Action, Claims 4 and 14 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kasuga “Formation of titanium oxide nanotube,”

American Chemical Society (1998) (hereinafter "Kasuga II"), in view of Grimes, "A sentinel sensor network for hydrogen sensing," Sensors (February 2003) (hereinafter "Grimes").

Applicants submit that Kasuga II do not teach or suggest a titania nanotube having a length of 10 μm or more for the reasons discussed in section (A) above, and that Grimes does not disclose a sensor having a length of 10 μm or more. Accordingly, Grimes does not make up for the deficiency of Kasuga II with respect to the length of the titania nanotube and therefore a *prima facie* case of obviousness has not been made because the cited references do not teach each and every limitation of Claims 4 and 14.

Withdrawal of the rejection is respectfully requested.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

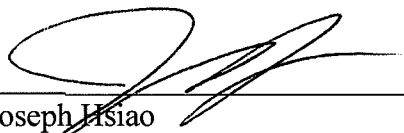
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